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Forest Pest Management

Pacific Southwest Region

September 3, 1999

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NE 99-9

Subject: Barkley Fire Administrative Study - Marking Guidelines For Fire Injured Trees
Final Monitoring Report

To: District Ranger, Almanor Ranger District

This summary documents information collected for the administrative study implemented to monitor the longevity of fire damaged trees in the Barkley fire area, Almanor Ranger District, Lassen National Forest. The objective of this study is to evaluate, document and monitor the survivability of trees marked according to Wagener's guidelines (Wagener, 1961) over a minimum of four years. These guidelines are often used to predict post fire tree mortality.

From September 18 to October 10, 1994, the Barkley Fire burned approximately 44,000 acres of National Forest and private land. Approximately 4,915 acres of National Forest land within the Lower Deer Creek Management Area burned outside of the Ishi Wilderness and the proposed Deer Creek Wild and Scenic River corridor.

The Barkley Fire Salvage project area consists of 265 acres (Figure 1). The trees were originally selected September 20, 1995. Fifty trees were selected in Unit 7 (175 acres) and 25 trees were selected in Units 3 (6 acres) and 4 (6 acres) (combined) for this study. A total of 59 ponderosa pine and 16 sugar pine trees have been monitored (Table 1). The condition of the trees when chosen is summarized below:

Sugar Pine:	Height ranged from 71 to 142 ft. DBH ranged from 14.9 to 43.4 in. Total crown as a percentage of height (44.6 to 89.4%). Crown scorch as a percentage of total crown (0 to 73.3%).
Ponderosa Pine:	Height ranged from 69 to 135 ft. DBH ranged from 11.6 to 41.9 in. Total crown as a percentage of height (42.3 to 92.9%). Crown scorch as a percentage of total crown (0 to 82.6%).

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Twenty-one ponderosa pine trees have died in Unit 7 and are summarized in Table 2. Fifteen of these twenty-one trees were successfully attacked by western pine beetle. Two had successful hits when chosen and thirteen were hit over the course of the study. The condition of the remaining live trees remained unchanged.

Three ponderosa pine trees died in units 3 and 4 and are summarized in Table 3. Red turpentine beetle attacks were present on all three trees when the study was initiated. The condition of the remaining live trees remained unchanged.

Over five years have passed since the Barkley fire so it is likely that most mortality directly related to fire injuries (crown and cambium kill) has already occurred. Future mortality is more likely to involve bark beetles attacking trees that are more susceptible due to their fire injuries rather that from fire injuries alone. Forest Pest Management will continue to monitor the survivability of the trees included in this study to validate the use of Wageners marking guidelines and to provide additional information on the effects of drought, combined with fire injuries and bark beetle-related damage, on tree survivability.

*****Conclusion paragraph needs to be added here*****

Please call Sheri Smith if you have any questions regarding this final report (530) 252-6667.

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Table 1.

Activity	Date
Burn	September 18 to October 10, 1994
Study Initiation	September 20, 1995
Monitored	July 17, 1996
Monitored	July 29, 1997
Monitored	October 17, 1997
Monitored	July 14, 1999

Table 2. **Unit 7**

Tree #	Species	Ht. (ft.)	DBH (in.)	Total Crown (ft.) (%)	%CrownScorch	Date Dead
5	PP	130	41.1	80 (61%)	63%	July 96
6	PP	135	43.4	103 (76%)	55%	July96
7	PP	81	17.2	57 (70%)	52%	Oct. 97
8	PP	100	23.7	80 (80%)	47%	Oct. 97
9	PP	128	27.1	96 (76%)	50%	Oct. 97
10	PP	110	23.3	95 (86%)	58%	July 96
17	PP	100	16.6	48 (48%)	58%	Oct. 97
18	PP	93	1935	58 (62%)	31%	Oct. 97
19	PP	106	19.2	81 (76%)	18%	Oct. 97
20	PP	110	22.3	65 (59%)	26%	Oct. 97
21	PP	98	18.1	54 (55%)	0%	Oct. 97
32	PP	102	18.9	70 (69%)	62%	July 96
33	PP	105	23	70 (67%)	28%	Oct. 97
34	PP	110	22.1	66 (60%)	41%	Oct. 97
35	PP	106	18.7	65 (61%)	10%	Oct. 97
36	PP	130	27.9	58 (45%)	45%	July 96
37	PP	124	21.6	75 (60%)	28%	July 96
42	PP	93	18.4	68 (73%)	25%	July 96
43	PP	95	16.1	65 (68%)	10%	July 96
45	PP	106	24.6	75 (71%)	55%	July 96
48	PP	84	19.2	60 (71%)	73%	Oct. 97

Table 3. **Units 3 and 4**

Tree #	Species	Ht. (ft.)	DBH (in.)	Total Crown (ft.) (%)	%Crown Scorch	Date Dead
1	PP	93	26.5	53 (57%)	28%	July 96
2	PP	78	18.5	60 (77%)	62%	July 96
3	PP	100	22.3	80 (38%)	38%	Oct. 97